WHAT IS CLAIMED IS:

1. A heat exchanger comprising:

a hot side passage for accommodating passage of a relatively hot fluid or gas therethrough;

a cold side passage for purpose of accommodating passage of a relatively cold fluid or gas therethrough, the hot and cold side passages being in contact with one another to permit heat transfer therebetween;

a thermal indicating means disposed within the heat exchanger and formed from a material designed to undergo permanent physical change when exposed to a predetermined temperature above a heat exchanger design operating temperature.

2. The heat exchanger as recited in claim 1 wherein the thermal indicating means is positioned in communication with one of the hot or cold side passage.

3. The heat exchanger as recited in claim 1 wherein the thermal indicating means is formed from materials selected from the group consisting of polymers, ceramics, composites cermets, metals, metal alloys, and mixtures thereof.

4. The heat exchanger as recited in claim 1 wherein the thermal indicating means is formed from one or more metals selected from the group consisting of Ag, Cu, Li, Zn, Pd, Ni, Sn, Mn, In, Dc, P, Al, and Au.

5. The heat exchanger as recited in claim 4 wherein the thermal indicating means is selected from a metal alloy comprising Ag, Cu, Zn and Pd..

6. The heat exchanger as recited in claim 1 further comprising a hot side fluid or gas inlet connected to the hot side passage, wherein the thermal indicating means is positioned proximate the hot side fluid or gas inlet.

7. The heat exchanger as recited in claim 1 further comprising a cold side fluid or gas inlet connected to the cold side passage, wherein the thermal indicating means is positioned proximate the cold side fluid or gas inlet.

8. A method for determining whether a design temperature for a heat exchanger has been exceeded, the method comprising the steps of:

providing a heat exchanger;

providing a thermal indicator within the heat exchanger that is formed from a material having a predetermined melting temperature above the design temperature;

exposing the heat exchanger to heat during operation; and

visually inspecting the thermal indicator to determine if it has melted.

9. The method as recited in claim 8 wherein during the step of providing a heat exchanger, the heat exchanger includes a hot side fluid or gas inlet, and wherein during the step of providing a thermal indicator, the thermal indicator is positioned in one of the hot or cold side fluid or gas inlet such that it becomes exposed to a fluid or gas stream entering the heat exchanger.

10. The method as recited in claim 8 wherein during the step of providing a thermal indicator, the material used to form the thermal indicator is formed from one or more metals selected from the group consisting of Ag, Cu, Li, Zn, Pd, Ni, Sn, Mn, In, Dc, P, Al, and Au.